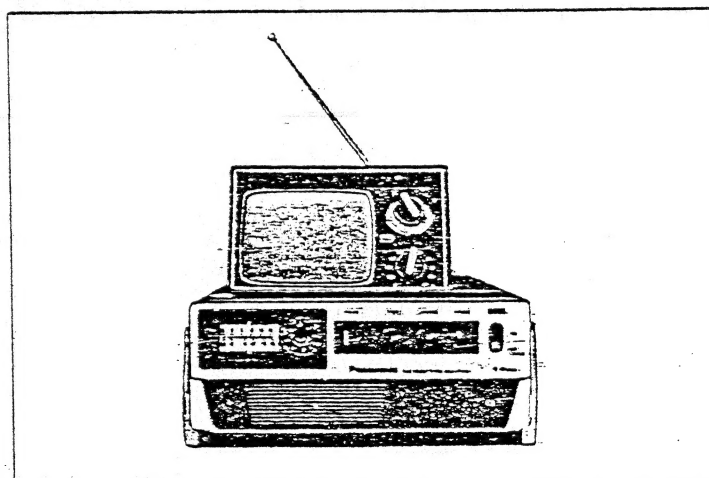


# Service Manual

Black and White Television  
TR-535/TR-535C

## Chassis No. T506-A Main Manual



### Specifications

Power Source:	AC: 120V 60Hz	DC: 12V	IC:	5
Power Consumption:	AC: 20W	DC: 6W	Picture Tube:	Type 140AKB4
Antenna:	UHF/VHF Monopole antenna			13 square inches
	75 Ohm Unbalanced type.			55° Deflection.
	VHF and UHF External antenna		Speaker:	3-1/2" Round type
	300 Ohm Balanced type		Audio Output:	Max. 360mW
Receiving Channels: TV	VHF 2ch-13ch USA Standard		Automatic Controls:	Keyed AGC
	UHF 14ch-83ch - USA Standard			(Automatic Gain Control)
Radio	FM 88 ~ 106 MHz			Saw-Tooth AFC
	AM530 ~ 1650 MHz			(Automatic Frequency Control)
Intermediate				AVR (Automatic Voltage Regulator)
Frequency:	Video: 45.75 MHz			ACP (Automatic Charge Protector)
	Sound: 41.25 MHz			ADP (Automatic Discharge
Stages:	Video: I-F: 3			Protector)
	Sound: I-F: 1(IC)		Dimensions:	Height: 5-1/2 inches
Transistors:	25			Weidth: 12-1/2 inches
Diodes:	21			Depth: 14 inches
High Voltage:	7.2 kV (Brightness &		Weight:	15-1/5 lbs
	Contrast are MIN)			With Panaloid Batteries

**Panasonic®**

Matsushita Electric Corp. of America  
50 Meadowland Parkway Secaucus,  
New Jersey 07094  
Matsushita Electric of Hawaii, Inc.  
320 Waiakamilo Road, Honolulu, Hawaii 96817

Matsushita Electric of Canada Ltd.  
40 Ronson Drive, Rexdale, Ont.

ORDER NO. 7505-007

## CAUTION

The high voltage supply at the picture tube anode will give an unpleasant shock, but does not supply enough current to give a fatal burn or shock. However, secondary human reaction to otherwise harmless shocks have been known to cause injury. Always discharge the picture tube anode to the receiver chassis before handling the tube. Certain portions of the high voltage generating circuit are dangerous and extreme caution should be observed. The picture tube is highly evacuated and, if broken, glass fragments will be violently expelled.

WHEN HANDLING THE PICTURE TUBE, ALWAYS WEAR GOGGLES AND PROTECTIVE CLOTHING.

## CONTROL LOCATION

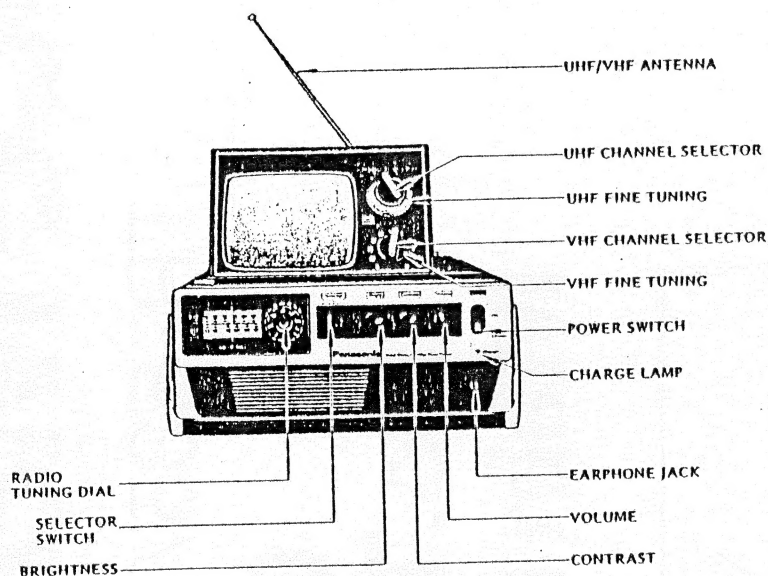


Fig. 1

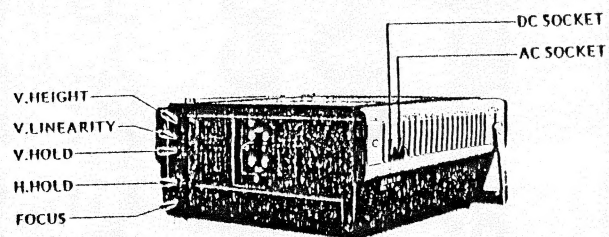


Fig. 2

## ADJUSTMENTS

### VERTICAL HEIGHT AND VERTICAL LINEARITY (Fig. 2)

- (1) These controls (VR32 and VR33) should be adjusted at the same time to give proper vertical size consistent good vertical linearity. The adjustment should be made to extend the picture limits approximately  $3/16"$  beyond the top and bottom edges of the mask.

### AGC (AUTOMATIC GAIN CONTROL)

The adjustment of the AGC control effectively changes the operating point of the AGC amplifier. Turn the control fully clockwise to set for maximum gain. In some areas this may cause clipping of the sync pulses, resulting in a wiggle in the picture and unstable sync. Turning the AGC control in a counterclockwise direction will decrease the gain of the receiver and diminish the wiggle.

### TO ADJUST THE AGC PROPERLY (Fig. 3)

- (1) Set the channel selector to a station transmitting a strong signal.
- (2) Set the R-F AGC control VR 19 to the center position.
- (3) Turn the I-F AGC control VR 18 fully counterclockwise, and the contrast and brightness controls fully clockwise.
- (4) Adjust the I-F AGC control VR 18 to obtain a sharp and clear picture. If I-F AGC control VR 18 is turned fully clockwise, the input signal strength will be maximum.
- (5) Observing the input signal, turn the R-F AGC control VR 19 clockwise or counterclockwise to the point where snow noise disappears in the picture.
- (6) Check the reception on all channels. There should be no wiggling. Make certain the picture does not disappear when the contrast control is turned to minimum.
- (7) Readjust AGC control slightly, if necessary. In very strong signal areas, where slight sync clipping is still evident, shorten antenna length or use a pad with an outside antenna to reduce signal input.

### YOKE POSITION (Fig. 5)

The yoke is secured to the neck of the picture tube with an angular clamp and screw. To adjust the yoke and correct picture tilt, loosen this clamp. Correct tilt and retighten the screw.

### CENTERING (Fig. 5)

The picture centering device consists of two rings located at the rear of the yoke assembly. Each ring has a tab for adjustment. The tabs should be rotated and moved towards or away from each other until the picture is properly centered on the screen of the picture tube.

### FOCUS (Fig. 2)

Adjust the focus control (VR64) for the sharpest and clearest picture.

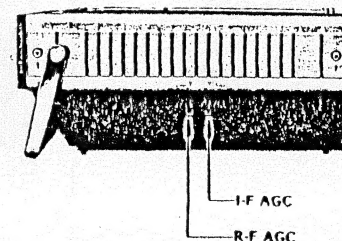


Fig. 3

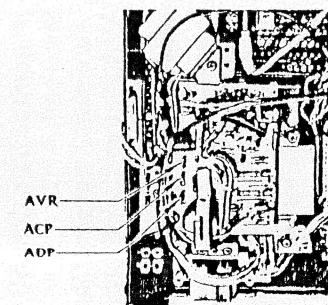


Fig. 4

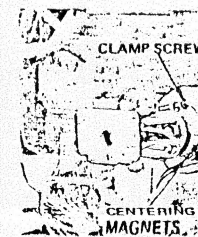


Fig. 5

## DISASSEMBLY INSTRUCTIONS

### Upper Cabinet Removal

1. Remove 5 mounting screws (A) shown in Fig. 6 and Fig. 7.

### POP-UP Block Removal

1. Remove the upper cabinet.
2. Remove 4 screws (B) shown in Fig. 8.
3. Picture Tube: Remove 4 screws (C) shown in Fig. 9.
4. Tuner Block: Remove 3 screws (D) shown in Fig. 9.

### Radio Block Removal

1. Remove the upper cabinet, 3 connectors and the picture tube Barrier as shown in Fig. 10.
2. Pull off the selector switch knob and the radio tuning dial.
3. Remove 2 screws (E) shown in Fig. 12.

### Volume Block Removal

1. Remove the upper cabinet and the radio block.
2. Remove 2 screws (F) shown in Fig. 11.

### Speaker and Power switch Removal

1. Remove the upper cabinet and the volume block.
2. Remove 2 screws (G) shown in Fig. 12.

### Main Circuit Board Removal

1. Remove the upper cabinet.
2. Pull off the V.Hold knob and H.Hold knob.
3. Remove a screw (H) shown in Fig. 11.
4. Pull the main circuit board upward.

### Power Circuit Board Removal

1. Remove the upper cabinet and the PUP-UP block.
2. Remove a screws (I) and 4 screws (J) shown in Fig. 13 and Fig. 11

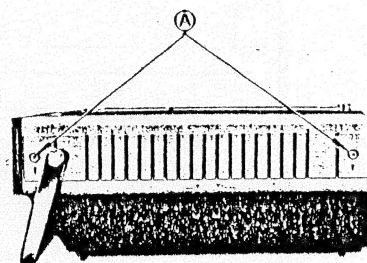


Fig. 6

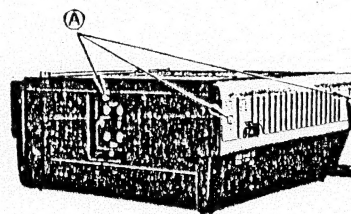


Fig. 7

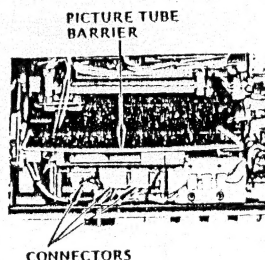


Fig. 10

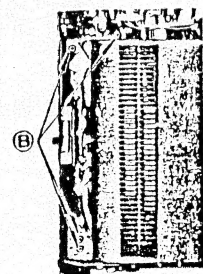


Fig. 8

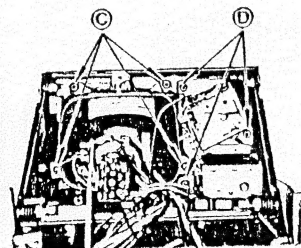


Fig. 9

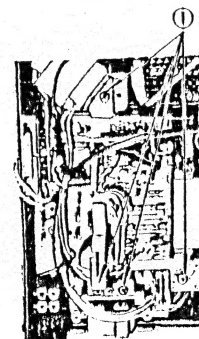
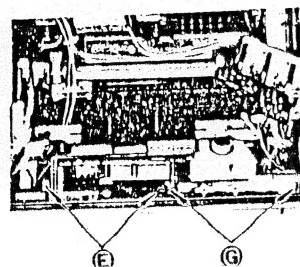
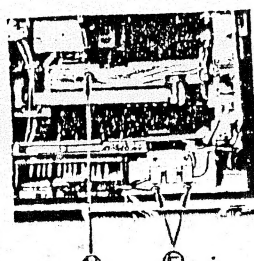


Fig. 13



## VIDEO I-F ALIGNMENT

### PREPARATION

1. Sweep & marker generator, oscilloscope and DC power supply . . . . . Connect and set as shown in Fig. 14
2. Connect the jumper lead between TP14 and TP15 as shown in Fig. 14

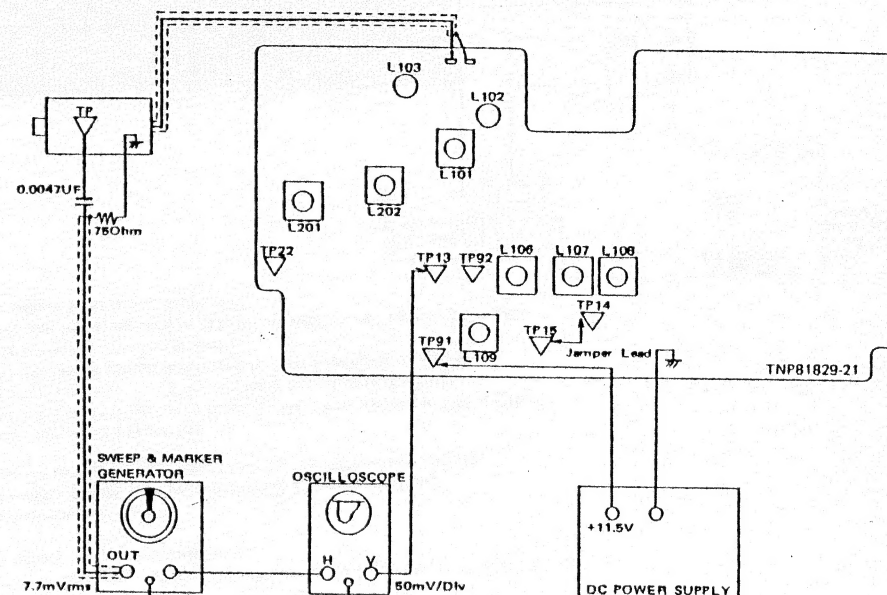


Fig. 14

### ALIGNMENT PROCEDURE

STEP	ALIGNMENT	WAVEFORM
1	Adjust L103 for the 41.25MHz marker position to fall shown in Fig. 15.	
2	Adjust L102 for the 47.25MHz marker position to fall shown in Fig. 15.	
3	Adjust both L101 and tuner converter coil to obtain the correct response curve shown in Fig. 15.	

Fig. 15



## SOUND I-F ALIGNMENT

### PREPARATION

1. Set the power switch to "ON" position.
2. Turn the volume fully counterclockwise.
3. Sweep & Marker generator and oscilloscope---connect and set shown in Fig.16.
4. Connect the jumper lead between S2 and TP23 as shown in Fig.16.

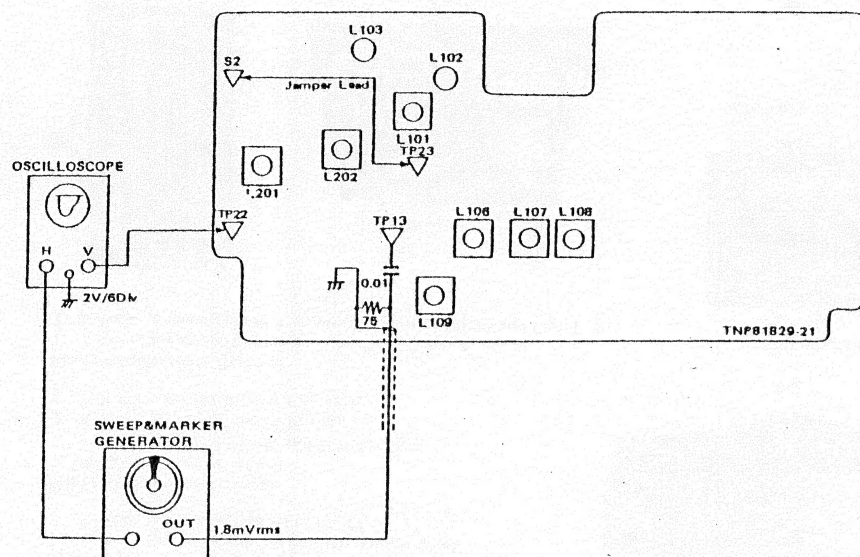


Fig.16

### ALIGNMENT PROCEDURE

STEP	ALIGNMENT	WAVEFORM
1	Adjust L202 to get the V curve shown in Fig.17 and adjust L201 to the maximum gain at 4.5MHz shown in Fig.17.	
2	Adjust L202 until the 4.5MHz marker is the center of slanted line shown in Fig.18.	

## AVR, ACP, ADP ADJUSTMENT

### CONNECTIONS

Connect as shown in Fig. 19.

### PREPARATION

1. Turn the VR71 fully counterclockwise.
2. Turn the VR72 and VR73 fully clockwise.

#### A. ACP circuit alignment procedure

1. Set the SW-1 and the SW-2 to ON position, and set the SW701 and the SW702 to OFF position.
2. Adjust the DC power supply voltage indicating V1 meter to the value which it indicates Fig.20 (Be sure to check the temperature. The voltage is changed by the temperature.)
3. Turn the VR72 clockwise and set the point where the charge lamp has started illuminating.
4. Confirm the operating voltage of ADP circuit shown in Fig.20 by rising the DC power supply voltage and dropping it.

#### B. AVR adjustment procedure

1. Set the SW-1 to ON position and the SW-2 to OFF position.
2. Set the V1 voltage to 11.5V by adjusting the AVR control VR71.

#### C. ADP circuit adjustment procedure

1. Set the SW-1 to OFF and set the SW-2, SW-3 and SW702 to ON position.
2. Set the V1 voltage to 11.0V by adjusting the DC power supply.
3. Set the point where the A1 ammeter has started swinging to zero by turning the VR72 counterclockwise.
4. Confirm the operating voltage (11.0V) of ADP circuit by rising the DC power supply voltage and dropping it.

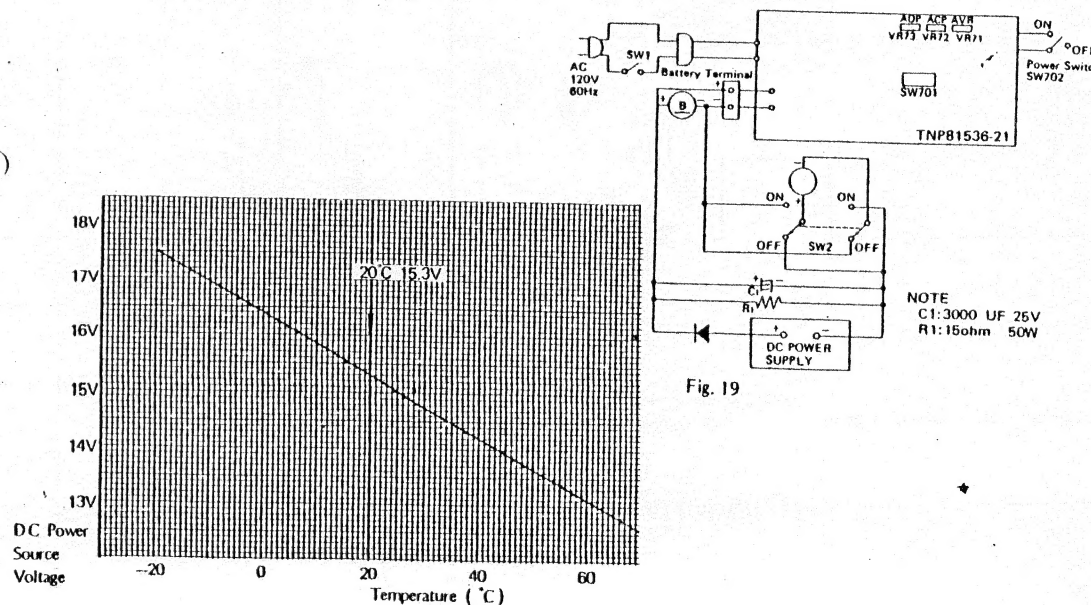


Fig. 19

NOTE  
C1:3000 UF 25V  
R1:15ohm 50W

Fig. 20



## NEW CIRCUIT EXPLANATION

### VIDEO I-F AMPLIFIER & AGC CIRCUIT (IC11 $\mu$ PC595C)

- (1) The tuner output is coupled through input filter to terminal pin No.1 of IC 11.
- (2) In the IC, the output from the input filter is amplified through the first amplifier stage and is then coupled to the gain control circuit, the output of which is further amplified and supplied to the succeeding stage filter.
- (3) Meanwhile, control signal from the I-F AGC amplifier is coupled to the gain control circuit; this control signal controls the gain of the video amplifier to stabilize the video amplifier output, that is, detection output.
- (4) The output of the I-F AGC amplifier is also coupled to the R-F AGC amplifier for comparison with a reference voltage VREF2 applied to IC terminal pin No. 13. The R-F AGC amplifier has a delayed AGC function and supplies AGC bias from terminal pin No. 12 of IC to the VHF tuner.
- (5) The gate circuit operates as keyed AGC. The detection output is coupled to IC terminal pin No.6, reference voltage VREF1 to terminal pin No.10, and keying pulse signal to terminal pin No.5, these signals being related as shown in Fig.21. The output of the gate circuit is provided only during the presence of a keying pulse, and its level according to the level of the detection output, as shown in Figs. 21-A and B, the level is reduced with decreasing detection output.
- (6) The gate circuit output is rectified through diode within the IC and filter connected to IC pin No.9, and the rectified output is applied to the I-F AGC amplifier. The amplified voltage output from the I-F AGC amplifier is applied to the gain control circuit for controlling the gain of the I-F amplifier.
- (7) Since the I-F signal from the input filter is amplified before it is coupled to the gain control, application of AGC voltage will not result in variation of the picture quality.

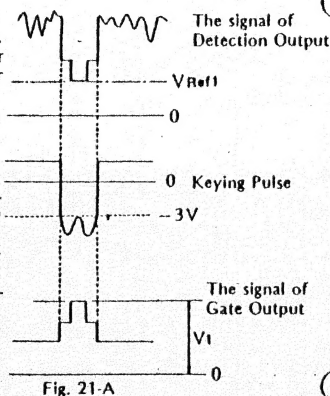


Fig. 21-A

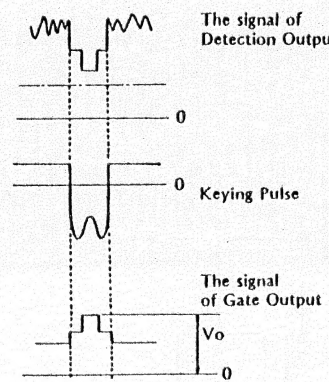
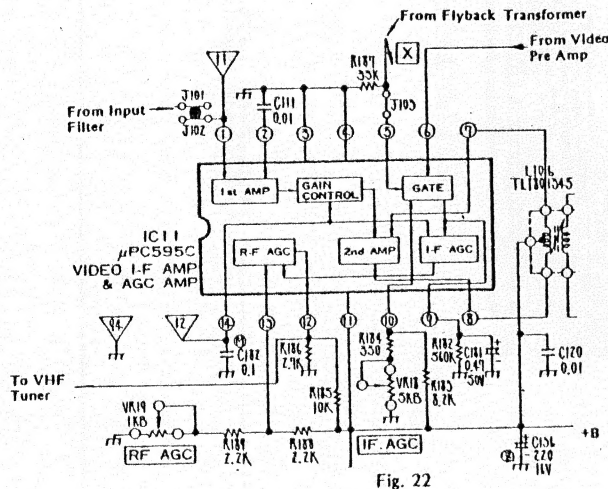
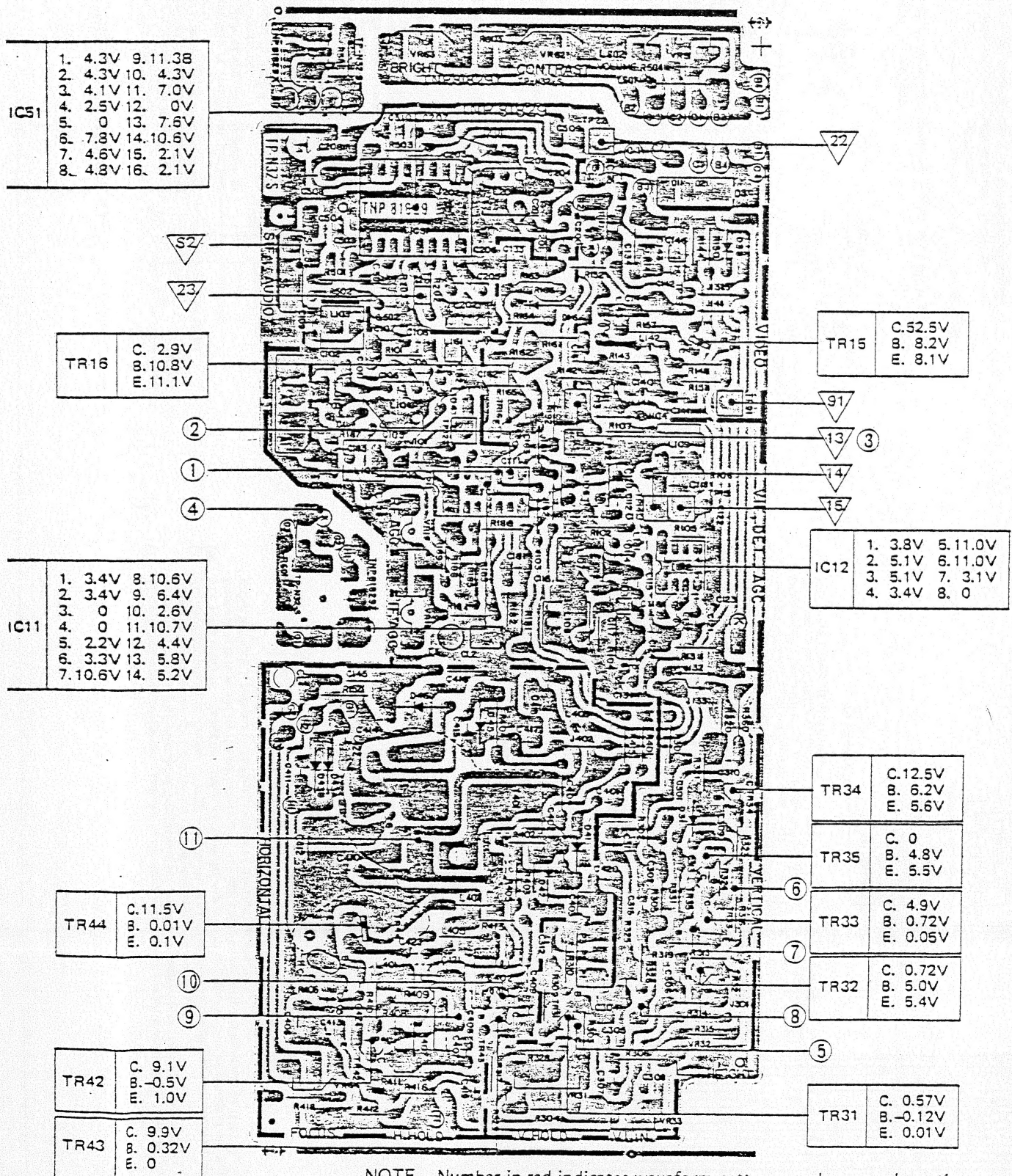


Fig. 21-B



# MAIN CIRCUIT BOARD

CONDUCTOR VIEW (TNP81829-21)

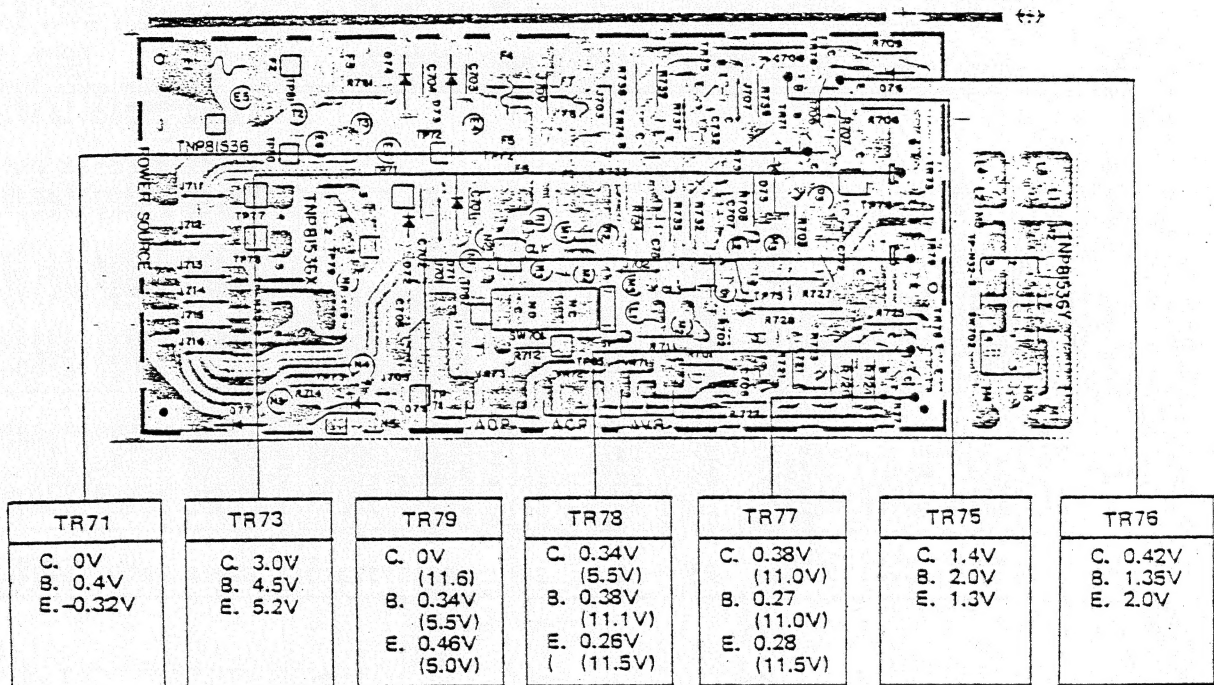


NOTE. Number in red indicates waveform pattern number on schematic diagram.



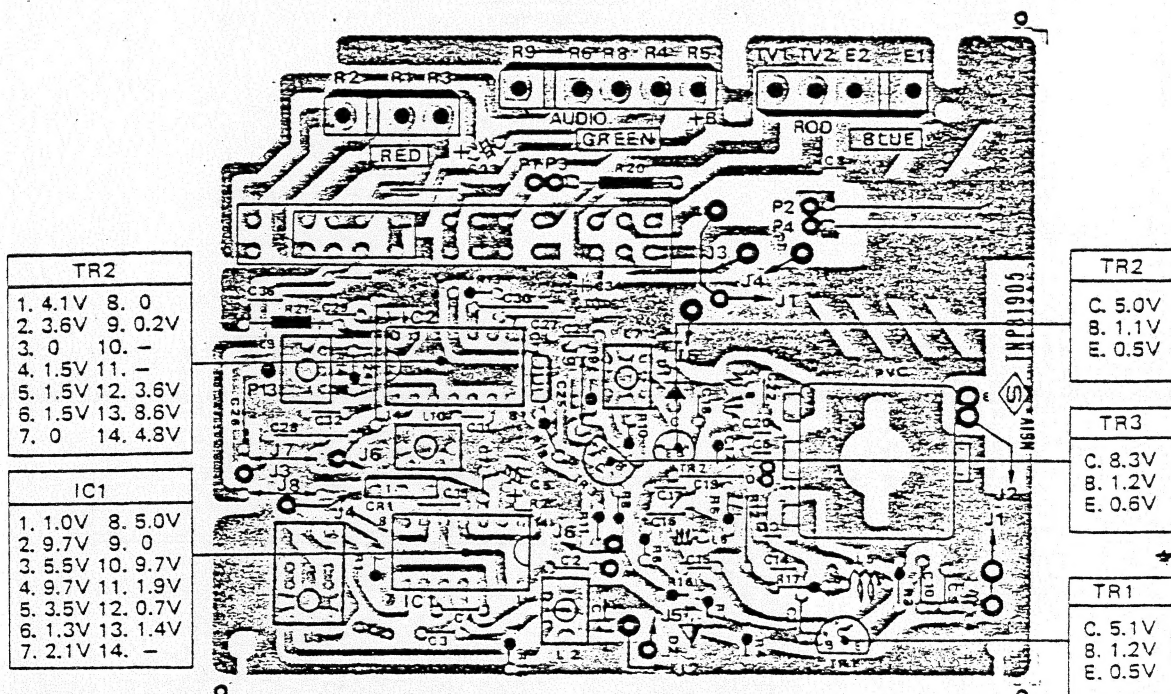
## CIRCUIT BOARD

### POWER SOURCE CIRCUIT BOARD CONDUCTOR VIEW (TNP81536-21S)



NOTE. The voltage in parenthesis is measured, when the power switch is set to "off" position.

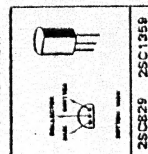
### -RADIO CIRCUIT BOARD CONDUCTOR VIEW (TNQ8215)





[illegible][illegible]

TRANSISTOR



IC 2

1 2 3 4 5 6 7

TVSSN76642N

14 13 12 11 10 9 8

BOTTOM VIEW

IC 1

TVSHA1151

1 2 3 4 5 6 7

8 9 10 11 12 13 14

BOTTOM VIEW

REF. NO.	PARTS NO.	PARTS NAME & DESCRIPTION	REF. NO.	PARTS NO.	PARTS NAME & DESCRIPTION
<b>TNQ8215 RADIO BOARD</b> <b>A'SSY PARTS</b> R-1 TKK800372 Dial Film Complete R-2 TSE80305 Selector Switch R-3 RDT9056A Tuning Shift R-4 RME11D Tuning Shaft Stopper R-5 RDD310A Poly Variable Capacitor Drum  R-6 RD54060A Thread Spring R-7 RDR13 Guide Roller R-8 RDR14 Guide Roller R-9 RDR21 Guide Roller R-10 RDR31A Roller Stay  R-11 RNW230A Roller Stopper R-12 RDF7A Dial Roller R-13 RUS108A Spread Spring R-14 RDS07-4 Rope R-15 PVC2LX20T-3M Poly Variable Capacitor			<b>CAPACITORS</b> C1 ECCD1H050CC Ceramic 4PF +0.25PF-0.25PF 50V C2 ECCD1H103PF Ceramic 0.01UF +100%-0% 50V C3 ECCD1H103PF Ceramic 0.01UF +100%-0% 50V C4 ECCD1H103PF Ceramic 0.01UF +100%-0% 50V C5 ECEA16V33L Electrolytic 33UF 16V  C6 ECKD1H102KB Ceramic 1000PF +10%-10% 50V C7 ECKD1H102KB Ceramic 1000PF +10%-10% 50V C8 ECKD1H080KB Ceramic 8PF +10%-10% 50V C9 ECCD1H470KC Ceramic 47PF +10%-10% 50V C10 ECCD1H101K Ceramic 100PF +10%-10% 50V  C11 ECCD1H102KB Ceramic 1000PF +10%-10% 50V C12 ECCD1H102KB Ceramic 1000PF +10%-10% 50V C13 ECCD1H181JC Ceramic 180PF +5%-5% 50V C14 ECCD1H102KB Ceramic 1000PF +10%-10% 50V C15 ECCD1H040C Ceramic 4PF +0.25PF-0.25PF 50V  C16 ECKD1H331KB Ceramic 330PF +10%-10% 50V C17 ECCD1H240JC Ceramic 24PF +5%-5% 50V C18 ECCD1H050CC Ceramic 5PF +0.25PF-0.25PF 50V C19 ECKD1H102KB Ceramic 1000PF +10%-10% 50V C20 ECKD1H1032F Ceramic 0.01UF +80%-20% 50V  C22 ECCD1H240JC Ceramic 24PF +5%-5% 50V C23 ECCD1H103PF Ceramic 0.01UF +100%-0% 50V C24 ECCD1H103KB Ceramic 0.01UF +10%-10% 50V C25 ECCD1H103PF Ceramic 0.01UF +100%-0% 50V  C26 ECCD1H4732F Ceramic 0.047UF +80%-20% 50V C27 ECCD1H103KB Ceramic 0.01UF +5%-5% 50V C28 ECCD1H103KB Ceramic 0.01UF +10%-10% 50V C29 ECCD1H103PF Ceramic 0.01UF +100%-0% 50V C30 ECQM05333MZ Polyester 0.033UF +20%-20% 50V  C31 ECCD1H150JC Ceramic 15PF +5%-5% 50V C32 ECCD1H103PF Ceramic 0.01UF +100%-0% 50V C33 ECEA16V33L Electrolytic 33UF 16V C34 ECEA16V33L Electrolytic 33UF 16V C35 ECKD1H103KB Ceramic 0.01UF +10%-10% 50V  C36 ECCD1H103PF Ceramic 0.01UF +10%-10% 50V C37 ECKD1H4732F Ceramic 0.047UF +80%-20% 50V		
<b>ICS</b> IC1 TVSHA1151 AM Radio IC2 TVSSN76642N Limiter, FM Det.			<b>C-R COMBINATION</b> CR1 EXAF2532152 Combination Resistor CF1 TFCA10R7A 10.7 Filter		
<b>TRANSISTORS</b> TR1 25C1359A RF TR2 25C1359A Converter TR3 25C829B Sound I-F			<b>BRACKETS</b> R-16 TKK809816 Radio Complete Mounting Bracket R-17 TKK809827 Slide Switch Mounting Bracket R-18 TUC80927 Shield Plate		
<b>DIODES</b> D1 OA90 Limiter D2 EYV320D1R21A Voltage Stabilizer			<b>TNP81829-21 MAIN CIRCUIT BOARD</b>		
<b>COILS &amp; TRANSFORMERS</b> L1 TLR80113 AM Antenna Coil L2 TLR80205 AM OSC Coil L3 RL17W105Q-T 455KHz Combination Filter L4 RLQY155-5 FM Peak Coil L5 RLD4Y44 FM R-F Coil  L6 RLQY755-5 FM Peak Coil L7 RL14H153-T FM I-F Trans. L8 RLO4Y43 FM OSC Coil L9 TLS803308 FM I-F Trans. L10 TLR807201 AM I-F Trans			<b>IC</b> IC11 TVSMPC595C Video I-F IC12 TVSMPC596C Video Detector IC51 AN255 Sound I-F		
<b>RESISTORS</b> R1 ERD14V1562 Carbon 5.6KOhm +5%-5% 1/4W R2 ERD14V1103 Carbon 10KOhm +5%-5% 1/4W R3 ERD14V1222 Carbon 2.2KOhm +5%-5% 1/4W R4 ERD14V1223 Carbon 22KOhm +5%-5% 1/4W R5 ERD14V1102 Carbon 1KOhm +5%-5% 1/4W  R6 ERD14V1103 Carbon 10KOhm +5%-5% 1/4W R7 ERD14V1272 Carbon 2.7KOhm +5%-5% 1/4W R8 ERD14V1273 Carbon 27KOhm +5%-5% 1/4W R9 ERD14V1102 Carbon 1KOhm +5%-5% 1/4W R10 ERD14V1472 Carbon 4.7KOhm +5%-5% 1/4W  R11 ERD14V1471 Carbon 470Ohm +5%-5% 1/4W R12 ERD14V1391 Carbon 390Ohm +5%-5% 1/4W R13 ERD14V1331 Carbon 330Ohm +5%-5% 1/4W R14 ERD14V1682 Carbon 6.8KOhm +5%-5% 1/4W R15 ERD14V1681 Carbon 680Ohm +5%-5% 1/4W  R16 ERD14V1152 Carbon 1.5KOhm +5%-5% 1/4W R17 ERD14V1561 Carbon 560Ohm +5%-5% 1/4W R18 ERD14V1151 Carbon 150Ohm +5%-5% 1/4W R19 ERD14T1151 Carbon 150Ohm +5%-5% 1/4W R20 ERD14T1151 Carbon 150Ohm +5%-5% 1/4W  R21 ERD14T1331 Carbon 330Ohm +5%-5% 1/4W			<b>TRANSISTORS</b> TR15 25C1566 Video Output TR16 25A564A Sync. Sep. TR31 25C828A Vert. Switching TR32 25A564A Vert. Stability TR33 25C828A Vert. Drive  TR34 25C1317 Vert. Output TR35 25A719 Vert. Output		

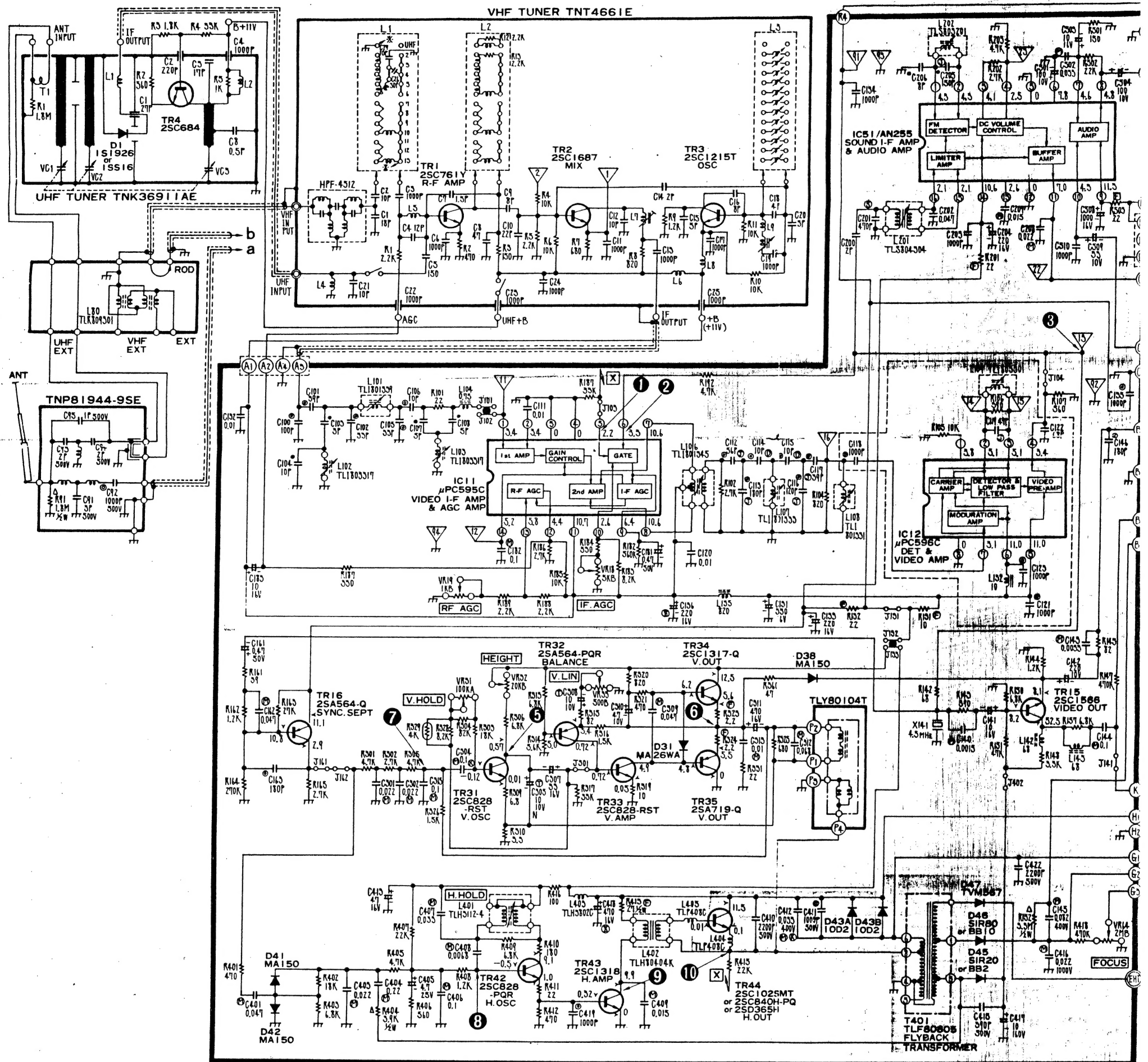
REF. NO.	PARTS NO.	PARTS NAME & DESCRIPTION	REF. NO.	PARTS NO.	PARTS NAME & DESCRIPTION	REF. NO.	PARTS NO.	PARTS NAME & DESCRIPTION	REF. NO.	PARTS NO.	PARTS NAME & DESCRIPTION
TR42	25C828A	Horiz. Osc.	C141	ECEA16V10L	Electrolytic 10UF 16V	R131	ERD14FJ100	Carbon 100hm +5%-5% 1/4W	R413	ERD12FJ270	Carbon 270hm +5%-5%
TR43	25C1318	Horiz. Drive	C142	ECEA10V220L	Electrolytic 220UF 10V	R132	ERD14FJ220	Carbon 220hm +5%-5% 1/4W	R415	ERD14TJ223	Carbon 22KOhm +5%-5%
TR44	25C1025MT	Horiz. Output	C143	ECQM05332KZ	Polyester 3300PF +10%-10% 50V	R142	ERD14TJ680	Carbon 680hm +5%-5% 1/4W	R416	ERD14TJ101	Carbon 100hm +5%-5%
DIODES			C144	ECQM05104MZ	Polyester 0.1UF +20%-20% 50V	R143	ERD14TJ391	Carbon 390Ohm +5%-5% 1/4W	R418	ERD14TJ474	Carbon 470KOhm +5%-5%
D31	MA26WA	Vert. Bias	C145	ECQM4823MZ	Polyester 0.082UF +20%-20% 40V	R144	ERD14TJ122	Carbon 1.2KOhm +5%-5% 1/4W	R501	ERD14TJ151	Carbon 150Ohm +5%-5%
D38	MA150	Vert. Blanking	C146	ECDD1H181K	Ceramic 180PF +10%-10% 50V	R145	ERD14TJ820	Carbon 820hm +5%-5% 1/4W	R502	ERD14TJ223	Carbon 22KOhm +5%-5%
D41	MA150	Horiz. AFC	C161	ECEA50Z847M	Electrolytic 47UF 50V	R147	ERD14TJ564	Carbon 560KOhm +5%-5% 1/4W	R503	ERD14FJ220	Carbon 220hm +5%-5%
D42	MA150	Horiz. AFC	C162	ECQM05473MZ	Polyester 0.047UF +20%-20% 50V	R148	ERD14TJ332	Carbon 3.3KOhm +5%-5% 1/4W	R504	ERD14TJ182	Carbon 1.8KOhm +5%-5%
D43A	TVS1002	Damper	C163	ECDD1H181K	Ceramic 180PF +10%-10% 50V	R150	ERD14TJ682	Carbon 6.8KOhm +5%-5% 1/4W	R581	ERD14TJ560	Carbon 560hm +5%-5%
D43B	TVS1002	Damper	C181	ECEA50Z847M	Electrolytic 47UF 50V	R151	ERD14TJ473	Carbon 47KOhm +5%-5% 1/4W	R601	ERD14TJ152	Carbon 1.5KOhm +5%-5%
D45	TVSS1R20	Video Rectifier	C182	ECQM0510MZ	Polyester 0.1UF +20%-20% 50V	R152	ERC12GK335	Solid 3.3MOhm +10%-10% 1/4W	R603	ERD14TJ473	Carbon 47KOhm +5%-5%
D46	TVSS1R80	Focus Rectifier	C183	ECEA16V10L	Electrolytic 10UF 16V	R157	ERD14TJ682	Carbon 6.8KOhm +5%-5% 1/4W	CERAP & CONTROLS		
D47	TVMS67	High Rectifier	C200	ECDD1H020CC	Ceramic 2PF +0.25PF-0.25PF 50V	R161	ERD14TJ390	Carbon 390hm +5%-5% 1/4W	X141	EFCA4R5M2	Cerap 4.5MHZ
COILS			C201	ECQS1471K	Styrol 470PF +10%-10% 100V	R162	ERD14TJ122	Carbon 1.2KOhm +5%-5% 1/4W	VR18	EVLS3AA00B53	I-F AGC
L101	TL1801339	Video I-F Coil	C202	ECKD1H473Z	Ceramic 0.047UF +80%-20% 50V	R163	ERD14TJ273	Carbon 27KOhm +5%-5% 1/4W	VR19	EVLS3AA00B13	R-F AGC
L102	TL1803317	Self Sound Trap	C203	ECKD1H102MB	Ceramic 1000PF +20%-20% 50V	R164	ERD14TJ274	Carbon 270KOhm +5%-5% 1/4W	VR31	EV066A25KA15	Vert. Hold
L103	TL1803317	Adjustment Sound Trap	C204	ECEA16V220L	Electrolytic 220UF 16V	R165	ERD14TJ272	Carbon 2.7KOhm +5%-5% 1/4W	VR32	EVLS0AA00B24	Height
L104	TLTR75-999	Fixed Input Coil	C205	ECDD1H151J	Ceramic 150PF +5%-5% 50V	R181	ERD14TJ333	Carbon 33KOhm +5%-5% 1/4W	VR33	EVLS0AA00B52	Vert. Linearity
L106	TL1801345	Coil Input Coil	C206	ECDD1H080CC	Ceramic 8PF +0.25PF-0.25PF 50V	R182	ERD14TJ564	Carbon 560KOhm +5%-5% 1/4W	VR51	EVVCOAF25U14	Sound Volume
L107	TL1801333	Coupling Coil	C207	ECQM05153MZ	Polyester 0.015UF +20%-20% 50V	R183	ERD14TJ822	Carbon 8.2KOhm +5%-5% 1/4W	VR62	EVVCOAF2513X	Contrast
L108	TL1801331	Coupling Coil	C208	ECQM05223MZ	Polyester 0.015UF +20%-20% 50V	R184	ERD14TJ331	Carbon 330Ohm +5%-5% 1/4W	VR63	EVVCOAF25B55	Brightness
L109	TL1805301	Video Det. Coil	C301	ECQM05223MZ	Polyester 0.022UF +20%-20% 50V	R185	ERD14TJ103	Carbon 10KOhm +5%-5% 1/4W	VR64	EVTS0AA00B26	Focus
L131	TLT821-999	Filter Choke Coil	C302	ECQM05223MZ	Polyester 0.022UF +20%-20% 50V	R186	ERD14TJ272	Carbon 2.7KOhm +5%-5% 1/4W	BRACKET		
L132	TLT100-999	Filter Choke Coil	C304	ECQM05104KZ	Polyester 0.1UF +10%-10% 50V	R187	ERD14TJ331	Carbon 330Ohm +5%-5% 1/4W	T15869070		Earphone Socket
L142	TLT680-999	Peaking Coil	C305	EC5Z10EF10N	Electrolytic 10UF 10V	R188	ERD14TJ222	Carbon 2.2KOhm +5%-5% 1/4W	TJ525640		Picture Tube Socket
L143	TLT680-999	Peaking Coil	C307	ECEA16V33L	Electrolytic 33UF 16V	R189	ERD14TJ222	Carbon 2.2KOhm +5%-5% 1/4W	TUC80519		Video I-F Shield Case
L201	TL5804304	Sound I-F Input Coil	C308	EC5Z10EF10N	Electrolytic 10UF 10V	R192	ERD14TJ472	Carbon 4.7KOhm +5%-5% 1/4W	TUC80520		Video I-F Shield Board
L202	TL5803201	Sound Det. Coil	C309	ECQM05473MZ	Polyester 0.047UF +20%-20% 50V	R201	ERD14FJ220	Carbon 220hm +5%-5% 1/4W	TUC80709		TR Heat Sink
L401	TLH3112-4	Horiz. Hold	C310	ECEA10V47LE	Electrolytic 47UF 10V	R202	ERD14FJ272	Carbon 2.7KOhm +5%-5% 1/4W	TWH883440		Anode Cap with Lead
L401	TLF80805	Flyback Transformer	C311	ECEA16V47L	Electrolytic 470UF 16V	R203	ERD14FJ472	Carbon 4.7KOhm +5%-5% 1/4W	TNP81536-215 POWER CIRCUIT BOARD		
L402	TLH80404K	Horiz. Drive	C312	ECQM05683MZ	Polyester 0.068UF +20%-20% 50V	R301	ERD14TJ472	Carbon 4.7KOhm +5%-5% 1/4W	TRANSISTORS		
L403	TLH3802C	Filter Choke Coil	C313	ECQM05103MZ	Polyester 0.01UF +20%-20% 50V	R302	ERD14TJ272	Carbon 2.2KOhm +5%-5% 1/4W	TR71	2SA564A	AVR
L404	TLP408C	Choke Coil	C315	ECQM05104MZ	Polyester 0.01UF +20%-20% 50V	R303	ERD14TJ183	Carbon 18KOhm +5%-5% 1/4W	TR73	2SD389	AVR
L405	TLP408C	Choke Coil	C401	ECQM05473MZ	Polyester 0.047UF +20%-20% 50V	R304	ERD14TJ823	Carbon 82KOhm +5%-5% 1/4W	TR74	2SA564A	ADP
L601	TLP408C	Choke Coil	C403	ECQM05223MZ	Polyester 0.022UF +20%-20% 50V	R305	ERD14TJ472	Carbon 4.7KOhm +5%-5% 1/4W	TR75	2SC828A	ADP
CAPACITORS			C404	ECQM05224MZ	Polyester 0.022UF +20%-20% 50V	R306	ERD14TJ682	Carbon 6.8KOhm +5%-5% 1/4W	TR76	2SA564A	AVR & ADP
C100	ECDD1H101K	Ceramic 100PF +10%-10% 50V	C405	ECEA25V47L	Electrolytic 4.7UF 25V	R309	ERD14TJ6R8	Carbon 6.8Ohm +5%-5% 1/4W	TR77	2SA564A	ACP
C101	ECDD1H1390K	Ceramic 39PF +10%-10% 50V	C406	ECQM05104MZ	Polyester 0.1UF +20%-20% 50V	R310	ERD14TJ3R3	Carbon 3.3Ohm +5%-5% 1/4W	TR78	2SA564A	ACP
C102	ECDD1H1330K	Ceramic 33PF +10%-10% 50V	C407	ECQM05333JZ	Polyester 0.033UF +5%-5% 50V	R313	ERD14TJ682	Carbon 6.8KOhm +5%-5% 1/4W	TR79	25C1226A	ACP
C103	ECDD1H030K	Ceramic 3PF +10%-10% 50V	C408	ECQM05682KZ	Polyester 6800PF +10%-10% 50V	R314	ERD14TJ562	Carbon 5.6KOhm +5%-5% 1/4W	DIODES		
C104	ECDD1H1000	Ceramic 10PF +0.5PF-0.5PF 50V	C409	ECQM05153MZ	Polyester 0.015UF +20%-20% 50V	R315	ERD14TJ820	Carbon 820hm +5%-5% 1/4W	D71	TVS1001	Power Rectifier
C105	ECDD1H330K	Ceramic 33PF +10%-10% 50V	C410	ECKD2H222MD	Ceramic 2200PF +20%-20% 500V	R316	ERD14TJ152	Carbon 1.5KOhm +5%-5% 1/4W	D72	TVS1001	Power Rectifier
C106	ECDD1H1000	Ceramic 10PF +0.5PF-0.5PF 50V	C411	ECKD2H102MB	Ceramic 1000PF +20%-20% 500V	R317	ERD14TJ333	Carbon 33KOhm +5%-5% 1/4W	D73	TVS1001	Power Rectifier
C107	ECDD1H050CC	Ceramic 5PF +0.25PF-0.25PF 50V	C412	ECQM4333KZ	Polyester 0.033UF +10%-10% 40V	R319	ERD14TJ100	Carbon 100hm +5%-5% 1/4W	D74	TVS1001	Power Rectifier
C108	ECDD1H050CC	Ceramic 5PF +0.25PF-0.25PF 50V	C413	ECEA16V47L	Electrolytic 47UF 16V	R320	ERD14TJ821	Carbon 820Ohm +5%-5% 1/4W	D75	TVSEQA01-05T	Zener
C111	ECKW1H103PF	Ceramic 0.01UF +100%-0% 50V	C415	ECKD2H391KB	Ceramic 390PF +10%-10% 500V	R321	ERD14TJ471	Carbon 470Ohm +5%-5% 1/4W	D76	MA150	AVR Start
C112	ECDD1H1560J	Ceramic 56PF +5%-5% 50V	C416	ECQE10223MZ	Polyester 0.022UF +20%-20% 10V	R323	ERD14FJ2R2	Carbon 2.2Ohm +5%-5% 1/4W	D77	TVS1001	Opposite Connection Protector
C113	ECDD1H181J	Ceramic 180PF +5%-5% 50V	C417	ECEA160V10	Electrolytic 10UF 160V	R324	ERD14FJ2R2	Carbon 2.2Ohm +5%-5% 1/4W	D78	TVS1001	Opposite Connection Protector
C114	ECDD1H1000	Ceramic 10PF +0.5PF-0.5PF 50V	C418	ECEA162470	Electrolytic 470UF 16V	R325	ERD14TJ821	Carbon 820Ohm +5%-5% 1/4W	CAPACITORS		
C115	ECDD1H1000	Ceramic 10PF +0.5PF-0.5PF 50V	C419	ECKD1H102MB	Ceramic 1000PF +20%-20% 50V	R326	ERD14TJ152	Carbon 1.5KOhm +5%-5% 1/4W	C701	ECKD2H472PE	Carbon 4700PF +100%-0%
C116	ECDD1H121J	Ceramic 120PF +5%-5% 50V	C422	ECKD2H222MD	Ceramic 2200PF +20%-20% 500V	R328	ERD14TJ822	Carbon 8.2KOhm +5%-5% 1/4W	C702	ECKD2H472PE	Carbon 4700PF +100%-0%
C117	ECDD1H390J	Ceramic 39PF +5%-5% 50V	C501	ECEA10V100L	Electrolytic 100UF 10V	R329	ERTD32H14025	Thermistor 4KOhm 3W	C703	ECKD2H472PE	Carbon 4700PF +100%-0%
C118	ECKD1H102MB	Ceramic 1000PF +20%-20% 50V	C502	ECQM05333MZ	Polyester 0.033UF +20%-20% 50V	R331	ERD14TJ220	Carbon 220hm +5%-5% 1/4W	C704	ECKD2H472PE	Carbon 4700PF +100%-0%
C119	ECDD1H470J	Ceramic 47PF +5%-5% 50V	C503	ECEA16V10L	Electrolytic 10UF 16V	R360	ERD14TJ470	Carbon 470hm +5%-5% 1/4W	C705	ECET35R2200S	Electrolytic 2200UF
C120	ECKW1H103PF	Ceramic 0.01UF +100%-0% 50V	C504	ECEA10V100L	Electrolytic 100UF 10V	R401	ERD14TJ47	Carbon 4700hm +5%-5% 1/4W	C706	ECEA10V33L	Electrolytic 33UF
C121	ECKD1H102MB	Ceramic 1000PF +20%-20% 50V	C508	ECEA16V1000E	Electrolytic 1000UF 16V	R402	ERD14TJ183	Carbon 18KOhm +5%-5% 1/4W	C707	ECEA10V100L	Electrolytic 100UF
C122	ECDD1H680K	Ceramic 68PF +10%-10% 50V	C509	ECEA10V33L	Electrolytic 33UF 10V	R403	ERD14TJ682	Carbon 6.8KOhm +5%-5% 1/4W	C708	ECEA25V10L	Electrolytic 10UF
C123	ECKD1H102MB	Ceramic 1000PF +20%-20% 50V	C510	ECKD1H102MB	Ceramic 1000PF 50V	R404	ERC12GK392	Solid 3.9KOhm +10%-10% 1/4W	C721	ECQM05472MZ	Polyester 4700PF +20%-20%
C131	ECEA16V330L	Electrolytic 330UF 16V	RESISTORS			R405	ERD14TJ472	Carbon 4.7KOhm +5%-5% 1/4W	C722	ECKD2H681K	Ceramic 680PF +100%-10%
C132	ECKW1H103PF	Ceramic 0.01UF +100%-0% 50V	R101	ERD14TJ220	Carbon 200hm +5%-5% 1/4W	R406	ERD14TJ561	Carbon 560Ohm +5%-5% 1/4W	C731	ECQM05103MZ	Polyester 0.01UF +20%-20%
C133	ECEA16V220L	Electrolytic 220UF 16V	R102	ERD14TJ272	Carbon 2.7KOhm +5%-5% 1/4W	R407	ERD14TJ223	Carbon 22KOhm +5%-5% 1/4W	C732	ECEA25V47	Electrolytic 4.7UF
C134	ECKD1H102MB	Ceramic 1000PF +20%-20% 50V	R104	ERD14TJ821	Carbon 820Ohm +5%-5% 1/4W	R408	ERD14TJ122	Carbon 1.2KOhm +5%-5% 1/4W			
C135	ECKD1H102MB	Ceramic 1000PF +20%-20% 50V	R105	ERD14TJ103	Carbon 10KOhm +5%-5% 1/4W	R409	ERD14TJ682	Carbon 6.8KOhm +5%-5% 1/4W			
C136	ECEA16Z220E	Electrolytic 220UF 16V	R106	ERD14TJ391	Carbon 390Ohm +5%-5% 1/4W	R410	ERD14TJ181	Carbon 180Ohm +5%-5% 1/4W			
C140	ECQM05152KZ	Polyester 1500PF +10%-10% 50V	R107	ERD14TJ561	Carbon 560Ohm +5%-5% 1/4W	R411	ERD14TJ220	Carbon 220hm +5%-5% 1/4W			
						R412	ERD14TJ471	Carbon 4700hm +5%-5% 1/4W			



REF. NO.	PARTS NO.	PARTS NAME & DESCRIPTION	REF. NO.	PARTS NO.	PARTS NAME & DESCRIPTION
RESISTORS			R735	ERD14TJ682	Carbon 6.8KOhm +5%—5% ¼W
01	ERD14TJ122	Carbon 1.2KOhm +5%—5% ¼W	R736	ERD14TJ103	Carbon 10KOhm +5%—5% ¼W
02	ERD14TJ821	Carbon 820Ohm +5%—5% ¼W	R737	ERD14TJ472	Carbon 4.7KOhm +5%—5% ¼W
03	ERD14TJ151	Carbon 150Ohm +5%—5% ¼W	R738	ERD14TJ123	Carbon 12KOhm +5%—5% ¼W
05	ERC12GK39T	Solid 390Ohm +10%—10% ¼W	R739	ERD14TJ102	Carbon 1KOhm +5%—5% ¼W
07	ERD14TJ221	Carbon 220Ohm +5%—5% ¼W	R741	ERC12ZGK185	Solid 1.8MOhm +10%—10% ¼W
08	ERD14TJ153	Carbon 15KOhm +5%—5% ¼W	VR71	EVLS0AA00B23	AVR
11	ERM12PKR47	Resin Coated 0.47Ohm ¼W	VR72	EVLS0AA00B14	ACP
12	ERD12FJ220	Carbon 220Ohm +5%—5% ¼W	VR73	EVLS0AA00B53	ADP
14	ERD12TJ681	Carbon 680Ohm +5%—5% ¼W	FUSES		
21	ERD14TJ222	Carbon 2.2KOhm +5%—5% ¼W	111	XBA2F04NU100	AC 0.4A Fuse
22	ERD14TJ433	Carbon 43KOhm +5%—5% ¼W	112	XBA2F10NU100	DC 1A Fuse
23	ERD14TJ273	Carbon 22KOhm +5%—5% ¼W	113	XBA-TET6NU100	DC 1.6A Fuse
24	ERD14TJ562	Carbon 5.6KOhm +5%—5% ¼W	SOCKET & SWITCHES		
25	ERD14TJ100	Carbon 10Ohm +5%—5% ¼W	114	TJS869080	AC/DC Socket
26	ERD14TJ103	Carbon 10KOhm +5%—5% ¼W	115	TSE80606	Pop up Switch
27	ERD12TJ201	Carbon 200Ohm +5%—5% ¼W	116	TSE80704	Power Switch
28	TRF2SK1R0	Non-Flame 1Ohm 2W	BRACKET & SCREWS		
31	ERTD2FHL332	Thermistor 3.3KOhm	117	TUC80709	Heat Sink
32	ERD14TJ332	Carbon 3.3KOhm +5%—5% ¼W		XTV3+8B	TR73, Mounting Screw
33	ERD14TJ223	Carbon 22KOhm +5%—5% ¼W		XSB3+10S	TR79, Mounting Screw
34	ERD14TJ123	Carbon 12KOhm +5%—5% ¼W		XNG3BS	TR79, Mounting Nut
				XWA3B	TR79, Mounting Washer

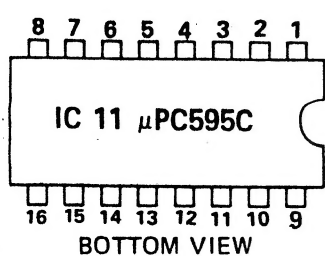
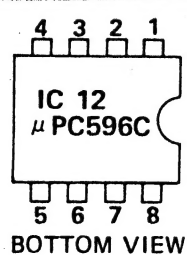
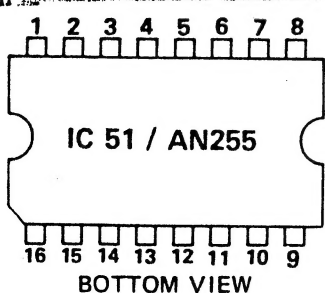


# SCHEMATIC DIAGRAM FOR MODE



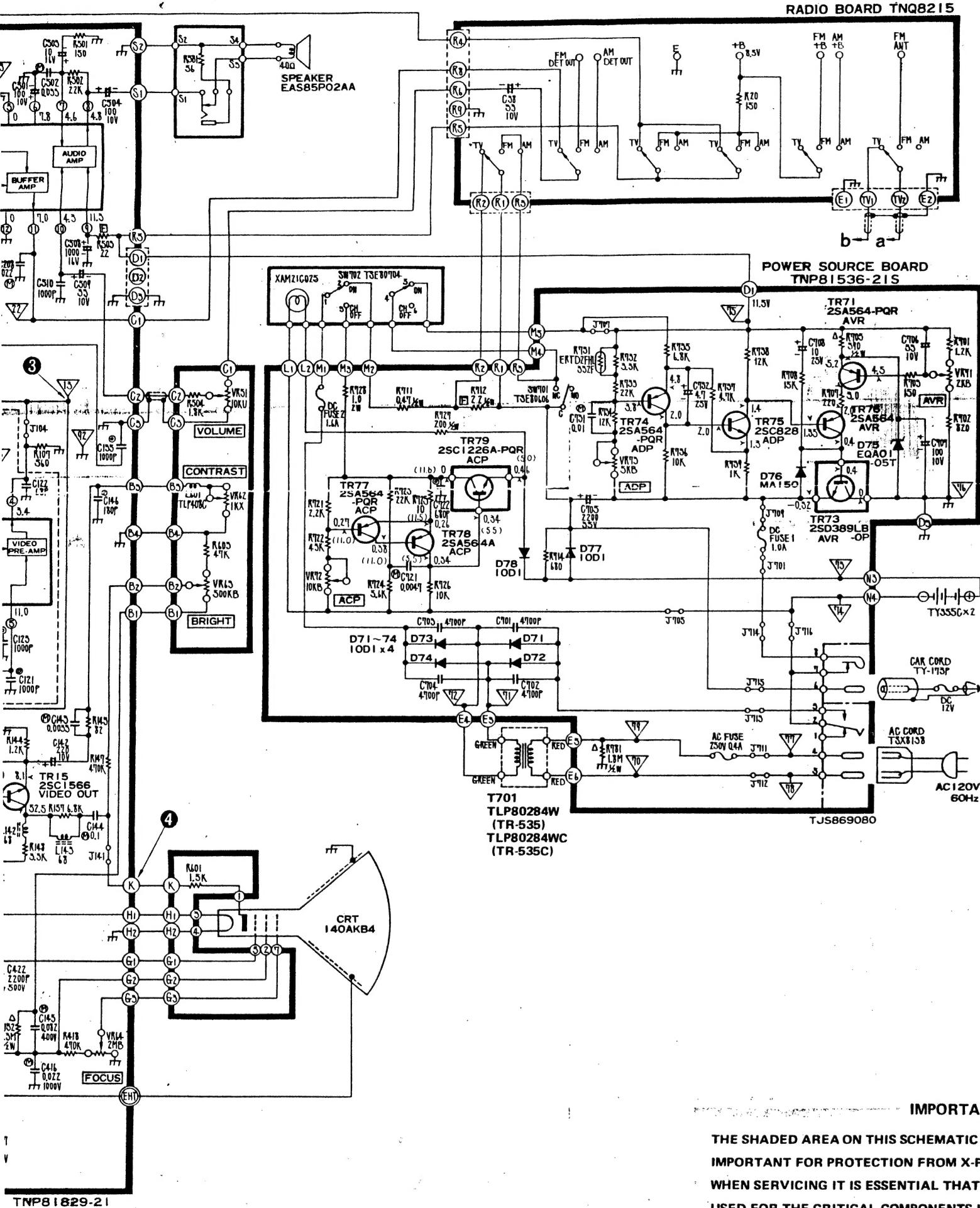
## IC TERMINAL INFORMATION

## TRANSISTOR BASE INFORMATION

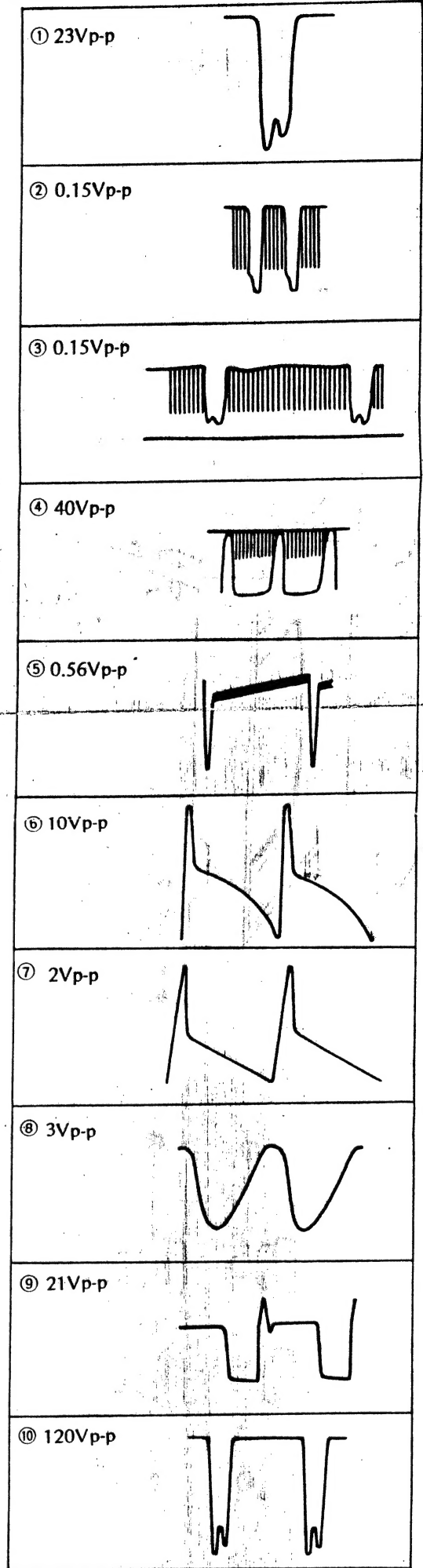


LOCATION	COLLECTOR BASE SWITCH	GROUND SWITCH	SWITCH COLLECTOR
	2SC717	2SC683	2SC1025MT
PARTS NAME	COLLECTOR BASE SWITCH	COLLECTOR BASE SWITCH	COLLECTOR BASE SWITCH
	2SA564A 2SC564A 2SC1317	2SA719 2SC828A 2SC1318	2SC1226A 2SC1566 2SD389

# R MODELS TR-535 & TR-535C



These waveforms were taken with normal signal. The peak-to-peak voltage set for maximum position. and contrast controls set for maximum position.



## IMPORTANT SAFETY NOTICE

THE SHADED AREA ON THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURER'S SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SHADED AREAS ON THE SCHEMATIC.

## NOTE

### 1. RESISTOR

All resistors are carbon 1/4W resistor, unless otherwise noted the following marks.

Unit of resistance is OHM ( $\Omega$ ). (K=1,000, M=1,000,000)

$\Delta$  : Solid resistor

$\square$  : Wire wound resistor

$\text{---}$  : Fuse resistor

$\bullet$  : Metal oxide resistor

$\text{---}$  : Thermistor

### 2. CAPACITOR

All capacitors are ceramic 50V capacitor, unless otherwise noted the following marks.

Unit of capacitance is  $\mu$ F, unless otherwise noted.

$\text{---}$  : Polyester capacitor

$\text{---}$  : Electrolytic capacitor

$\text{---}$  : Polystyrene capacitor

### 3. COIL

Unit of inductance is  $\mu$ H.

### 4. TEST POINT

$\nabla$  : Test point position.

### 5. VOLTAGE MEASUREMENT

Voltage is measured by a volt ohm meter with DC 20K OHM/V receiving normal signal, when all controls are set to the maximum position.

The voltage in parenthesis is measured when the power switch is set to "off" position.

### 6. Number in red circle indicates waveform number.

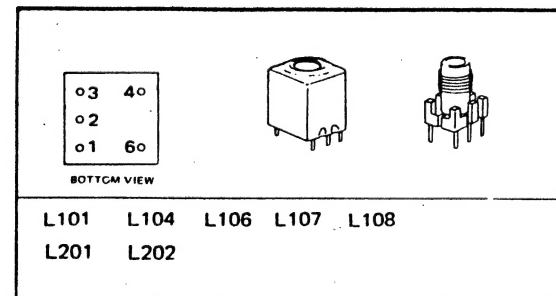
### 7. When arrow mark ( $\nearrow$ ) is found, connection is easily found along with the direction of an arrow.

### 8. When schematic diagram of a board is described in more than two places, they are encircled with dotted line (---).

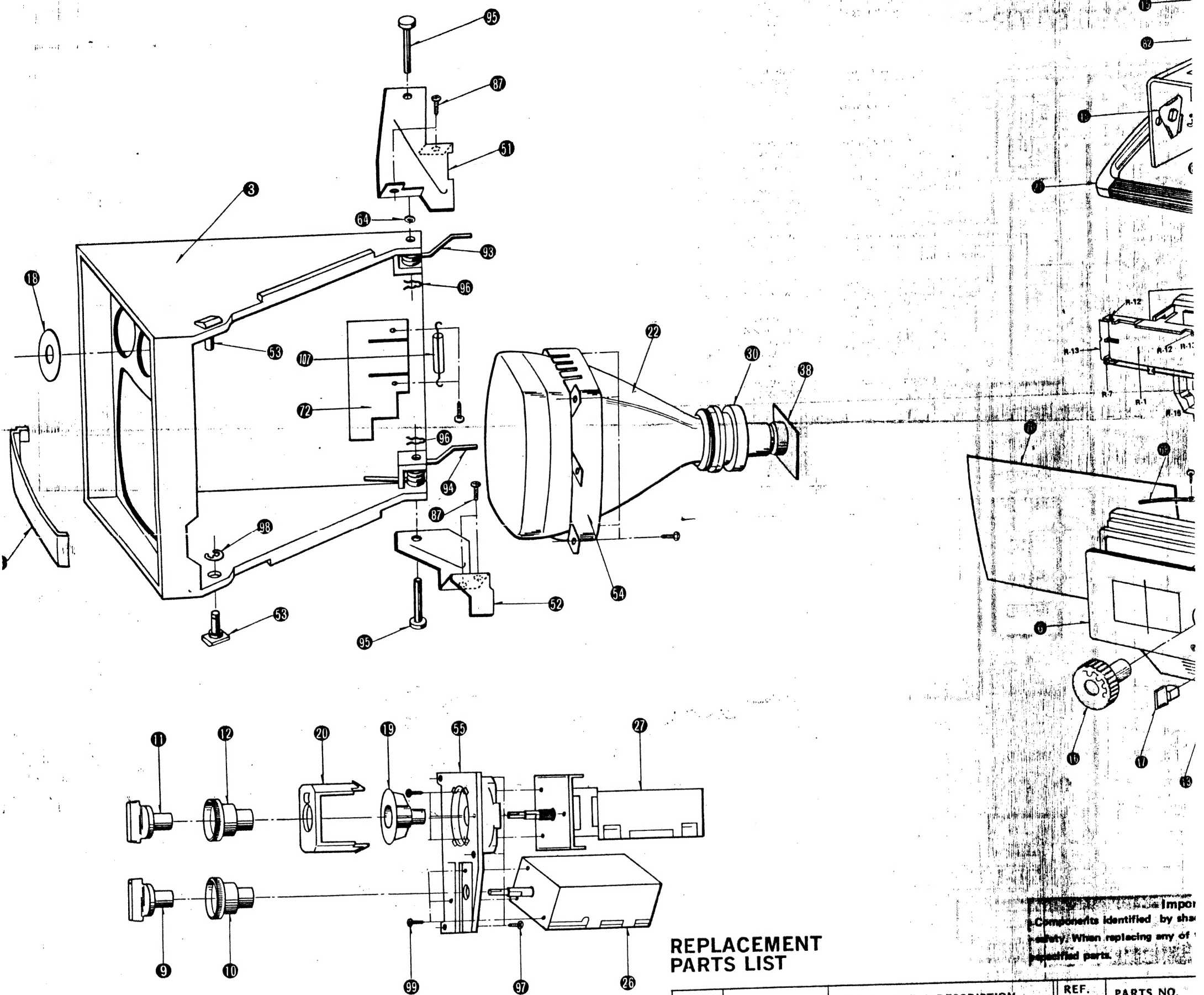
### 9. This schematic diagram is the latest at the time of printing and subject to change without notice.

(Mar. 1975)

## TRANSFORMER TERMINATION INFORMATION



# EXPLODED VIEW



## REPLACEMENT PARTS LIST

REF. NO.	PARTS NO.	PARTS NAME & DESCRIPTION	REF. NO.	PARTS NO.
<b>CABINET PARTS</b>				
1	TKY802301	Upper Cabinet	30	TLY80104T
2	TKY802101-1H (TR-535)	Under Cabinet Complete	31	EAS85P02AA
2	TKY802101-2H (TR-535C)	Under Cabinet Complete	32	EAE3YDAA
3	TKY802201-1H	Escutcheon Complete	33	TSA141-1S
4	TKP8052751	Aluminum Panel	34	TSX8138
5	TKK39317	Lamp Indicator Plate	35	XAM21C025
6	TKP8011591-1	Radio Transparent Plate	36	TJB802425
7	TBM82628-1 (TR-535)	Model Plate	37	TJS869070
7	TBM82643-1 (TR-535C)	Model Plate	38	TJS25640
8	TKG809638	Front Glass	39	TLR809316
9	TBX80765	VHF Channel Knob	40	TJB80906-1
10	TBX80758-1	VHF Fine Tuning	41	TPC803271
11	TBX80759	UHF Channel Knob	42	TPC803321
12	TBX80757-1	UHF Fine Tuning	43	TPC803321 (TR-535C)
13	TBX80581-1	Small Knob	44	XAPD01535
14	TBX80583-1	Vert./Horiz. Knob	45	TPE84023
15	TKK809810	Pop-up Button	46	TQB83494
16	TBX80582	Radio Tuning Dial Knob	47	TQB83508 (TR-535)
17	TBX80557-3	Radio-TV Selector Knob	48	TQB83508 (TR-535C)
18	TKP8010961	VHF Indicator Plate	49	TQB82494 (TR-535)
19	TKK800357-4	UHF Indicator Plate	50	TQB82508 (TR-535C)
20	TKK800356	UHF Indicator Transparent Plate	51	TQB82500
21	TKK800226	Handle Complete	52	TQD8112069-1
22	140AKB4	Picture Tube	53	TQD811266 (TR-535)
23	TNP81829-21	Main Circuit Board Complete	54	TQD811266 (TR-535C)
24	TNP81536-21	Power Circuit Board Complete	55	TQB32894P
25	TNP81944-1H	U/V Signal Separator Circuit Board Complete	56	TNQ8215
26	TNT4661E	VHF Tuner	<b>BRACKETS</b>	
27	TNK36911AE	UHF Tuner	42	TKK809240
28	TLF80805	Flyback Transformer	43	TKZ800925Z
29	TLP80284W (TR-535)	Power Transformer	44	TUW80977Z
29	TLP80284WC (TR-535C)	Power Transformer	45	TMK81252

Important  
Components identified by star  
When replacing any of  
specified parts.



